

THE TECHNOLOGIST AS MANAGER FORMULA FOR FAILURE?

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Thomas A. Edison never forgot his role as a business man. The profit motive was an essential part of his temperament. Once he said practically to a friend, referring to a newspaper article which discussed him as a scientist, "That's wrong. I am not a scientist. I am an inventor. Faraday was a scientist. He didn't work for money, he hadn't the time. But I do. I measure everything I do by the size of a silver dollar. If it don't come up to that standard, then I know it's no good."

A botanist found a beautiful plant by the wayside. He sat down to analyse it. He pulled it apart and examined every part under a microscope. When he had finished, he could tell the colour of the flower, its classification, and the number of stamens and pistils and petals and bracts, but the life and the beauty and the fragrance had gone.

INTRODUCTION

My purpose in this paper is to get you thinking; to stimulate you to confront the issues relating to the technologist in the management role and act as a catalyst for subsequent discussions which might lead to strategies for better equipping the technologist for the management task. I would like to approach the discussion by posing two hypotheses; an approach which should be empathetic to the *modus operandi* which many of you use in your own occupations.

Hypothesis 1

That technologists are ill equipped by virtue of their training, values and other personality characteristics for the role of management.

Hypothesis 2

That the role of management, in the technological context, is in, and of itself, a precondition for failure in the job.

These hypotheses, supportable or otherwise, would not be worth discussing but for the fact that a large proportion of engineers and scientists, at some stage of their careers, will be in a management role and that proportion is increasing. We don't have statistics for the Australian scene but the US picture indicates that over 70% of engineers are working in jobs with a significant management content by the time they are in their mid-to-late forties. A related point is that, although the technologist manages primarily other technologists, in-

creasingly, there is evidence that he/she will move into the general management role. Again, quoting US experience, it is estimated that in the '80s, more than 50% of chief executives will be holding engineering degrees.

HYPOTHESIS 1

That technologists are ill equipped by virtue of their training, values and other personality characteristics for the role of management.

The training orientation of most technologists focuses heavily on technical subjects. Where they are exposed to other material, they often resent this, seeing it as a digression, or worse still, a soft option, not requiring the same commitment as their main stream studies. An increasing number of applied science and engineering undergraduate programs are incorporating management studies but in most cases, I consider this largely a waste of time.

The motivations for this broadening influence are quite diverse and may include any or all of the following:

1. It's a break from the rigors of the technical studies.
2. The incorporation of management or business studies may make the program more attractive to potential students. This view derives from the observed success and growth of business studies programs.
3. There is someone on the teaching staff who once did a course in administration and would like to teach management.
4. There is someone on the staff who is finding the maintenance of currency in their technological area too difficult and would like to find something apparently less demanding.
5. Last and not least, incorporation of management-related units is perceived to be educationally desirable. The most material evidence of this motive is the use of management experts from outside the technology faculty to teach the material required.

Having said this, we should be quite clear that management training is required for technologists, particularly those who aspire to management roles. The question is, when? I have some doubts that the undergraduate program is the appropriate place, or course. I do recognise that the undergraduate program heavily emphasises the development of analytical skills. Further, these very skills which will probably determine

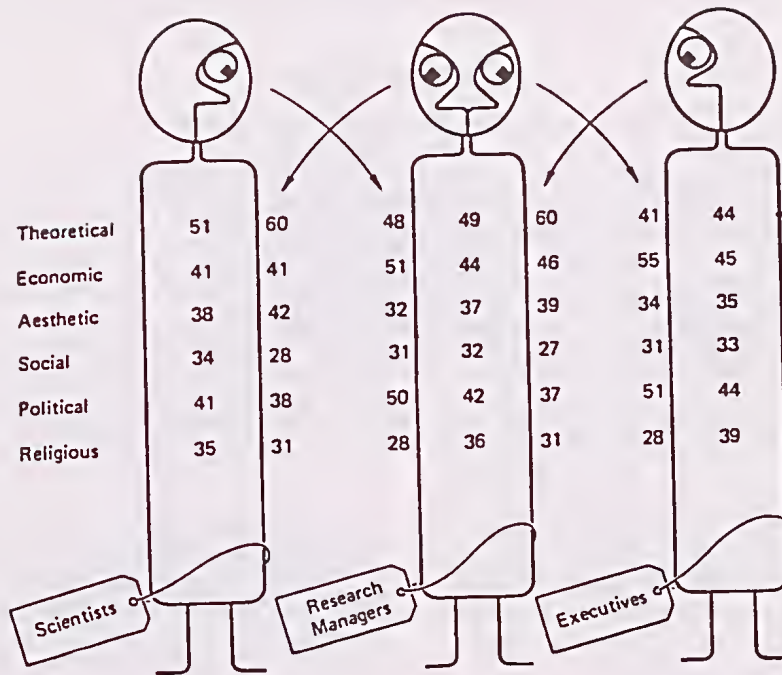


Fig. 1—Values of Scientists, Research Managers and Executives—Self Ratings Versus Ratings Expected From Others (Guth and Taguiri, 1965)

the success of the technologist, are counterproductive to effectiveness as a manager.

The training of engineers and scientists typically emphasises the reduction of all problems to terms that can be dealt with by objective measurement and established formulas based on predictable regularities (Badawy, 1982).

Peter Drucker highlighted the dangers of this orientation many years ago. "I am a figures man, and a quantifier, and one of those people to whom figures can talk . . . Reports are very comforting to me; they tell me a great deal. But they have also misled me often enough to make me realise that unless I go out and gain understanding, I may be acting on yesterday, even though the information is up to date."

Turning to personal values, we find considerable support for the view that there are differences in values between those in managerial roles and other organisation members. For the purposes of this discussion, a value is defined as a tendency to prefer certain states of affairs over others. Values may be conceived in a systems framework and one's value system defined as "a relatively permanent perceptual framework which shapes and influences the general nature of an individual's behaviour."

In a landmark study, Guth and Taguiri (1965) studied the values of nearly 1,000 scientists, research

managers and executives. Using the Allport, Vernon and Lindzey instrument they measured the values of these groups and the results are summarised in Fig. 1.

Subsequent research has tended to support the view that value systems influence occupational choice and direction. Although the difference in value systems might be interesting, the key question, of course, is, are they relevant? Management has been defined as "getting things done with and through others." The process of management is often described as "planning, organising, directing and controlling resources in order to produce goods and services." We might elaborate the technology managerial role as "planning, organising, directing, and controlling the activities of engineers, scientists, designers etc. to achieve desired goals in technologically related functions."

An increasing amount of research recently has attempted to address the question of management competencies. Without exploring this in any depth, we can, with some confidence say that there is a strong requirement for interpersonal skills, a preparedness to acquire and use power, and an orientation toward the achievement of measurable results and pragmatism. This implies that people who are likely to derive satisfaction from the managerial role are most likely to have consonant value systems. And indeed the research supports this view. Conversely, those with different value

TABLE I
TECHNICAL MANAGEMENT AND TECHNICAL SPECIALIST—SOME ROLE DIFFERENCES*

Technical Management	Technical Specialist
Counsels, guides, directs people	Is consulted by people
Is sensitive to feelings, attitudes	Is intuitive, creative
Evaluates people's performance	Evaluates data systems or methods
Forecasts, analyzes, controls costs	Technical performance outranks cost
High verbal skill required	High analytical skill required
Transmits and enforces policy	Logic outranks conformity
Directs what methods to use	Determines operational methods
Makes decisions from insufficient data	Seeks additional data
Accepts organizational hierarchy	Accepts hierarchy of truth
Seeks relationships to business goals	Seeks relationships among technical facts

* Source: Balderston, J. L. 1978. Do You Really Want to Be a Manager? *Journal of the Society of Research Administrators* 1X, 4.

systems, particularly values usually found in association with technology, are likely to experience frustrations and tensions when called upon to fill a role which requires behaviour which is dissonant with their values.

HYPOTHESIS 2

That the role of management, in the technological context, is in, and of itself, a precondition for failure in the job.

If Hypothesis 1 has any validity, and please remember I am offering hypotheses, not facts, or even theories, then we already have support for this second postulate. I have already suggested that there is an intrinsic conflict between the values typically held by scientists and managers, and their educational orientation. I now want to suggest that this conflict is emphasised by the role prescription of the scientist and manager.

The problem which is enunciated here is not typical to scientists, but is generic to any group of professionals and their managers. Usually, the most competent technician, the best qualified professional, is the most obvious candidate for promotion to the managerial role. Yet, research indicates that this background not only does not prepare the professional for management but may even equip him/her for failure. Most professionals' primary orientation is to their profession. I have known accountants leave their organisation rather than risk their professional standing through association or participation in what they consider to be questionable behaviour of their employer. Scientists who accept promotion to a managerial role experience the same conflict as they realise that their professional standing or current

cy is threatened by the additional demands and different behaviours imposed on them.

These generalisations need to be tempered according to the level of pragmatism shaping the perceptions of the individual. Thus, the engineer, as an applied scientist, has more in common with the manager with stronger pragmatic orientations and more similar career objectives. And indeed, as has already been indicated, we do find a high proportion of engineers embarking on managerial careers. Badawy suggests that the "management culture", that is, an amalgam of personality characteristics, management styles, value systems, type of position and management level involved is much more compatible, with the engineering culture than that of the scientist, particularly, the researcher.

As indicated at the outset, the purpose of this paper has been to set a basis for the subsequent discussions, to stimulate thought and to consider the management role in the context of the scientist/technologist. The problems of management for the technologist are quite different than for the typical manager, although similar to those faced by other professional groups. An understanding of these problems can be improved through an exploration of the educational experiences, the value systems, and role expectations of the manager and the scientist, and relating these to the role of the scientist manager (Table 1).

It seems to me, in conclusion, that the consideration of these matters is of importance if we accept that effective management of technological functions is likely to be an emerging area of concern in line with the resource commitment which these functions are attracting.